National Aeronautics and
Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

November 2010 NASA Sounder Workshop Recap

Recommendations relevant to current instruments

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Jet Propulsion Laboratory / California Institute of Technology

AIRS Science Team Meeting, Caltech

November 8-11, 2011

National Aeronautics and Space Administration

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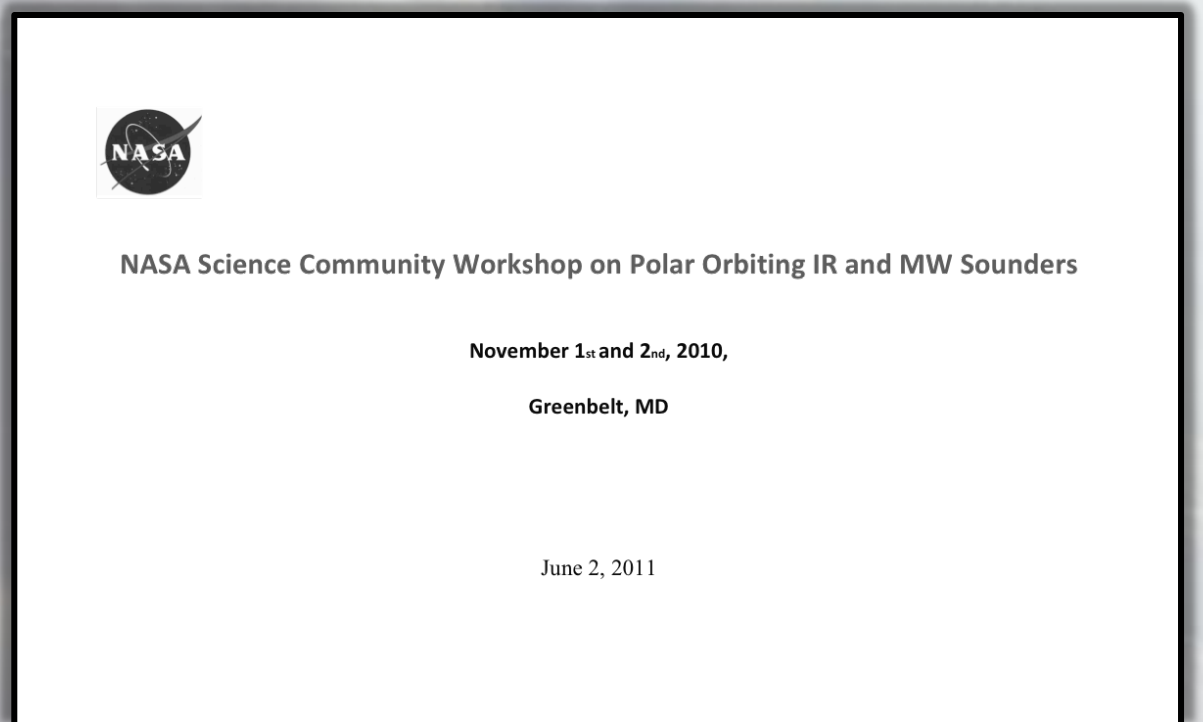
The Workshop Report

- ***Available at http://nasa-sounder-workshop.jpl.nasa.gov/***
- ***Authors*: Tom Pagano, Joel Susskind, Kevin Bowman, Chris Barnet, Eric Fetzer**

- ***Contents*: Objectives, Executive Summary, Overview of Sessions, Summary of Recommendations.**



NASA Science Community Workshop on Polar Orbiting IR and MW Sounders

November 1st and 2nd, 2010,

Greenbelt, MD

June 2, 2011

National Aeronautics and
Space Administration

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Three Sessions at Workshop

- **Climate**
- **Composition**
- **Weather**

Each group made a set of recommendation.

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Recommendations
Lots more in the report

Primary Recommendations

Recommendation I: The formation of a US based Sounding Science Team is required to identify the current and future needs of the weather, climate and atmospheric composition communities using data from the IR and MW sounders.

Recommendation II: The JPSS enable the full spectral resolution possible with the FM-1 CrIS on NPP as soon as possible.

Recommendation III: NASA should begin development of an advanced IR sounder with high spatial resolution and improved spectral resolution to be ready to follow the current planned sounders expected to retire in the 2020 timeframe.

Detailed Session Recommendations

SESSION 1: Climate

Recommendation 1.1.1: The value of monitoring long-term variability and extreme climate events should be emphasized in all sounding systems.

Recommendation 1.1.2: Further research to generate new and improved products from AIRS and IASI is needed, especially with regard to cloud and dust microphysical and radiative properties. Improved theoretical techniques are needed for multiple scattering at finer spatial resolution.

Recommendation 1.1.3: Fully characterize IASI performance with increasing cloud cover, using AIRS as baseline. Evaluate 3+ years of IASI products generated by NOAA using an AIRS science team-like algorithm. Compare interannual differences and trends obtained from AIRS and IASI products. Repeat this experiment using a NOAA IASI retrieval algorithm when it becomes available.

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NPP- and IASI- specific recommendations

SESSION 1: Climate

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Recommendation 1.1.3: Fully characterize IASI performance with increasing cloud cover, using AIRS as baseline. Evaluate 3+ years of IASI products generated by NOAA using an AIRS science team-like algorithm. Compare interannual differences and trends obtained from AIRS and IASI products. Repeat this experiment using a NOAA IASI retrieval algorithm when it becomes available.

Recommendation 1.2.1: Repeat the last recommendation, using CrIS and IASI-B retrievals when these data sets become available.

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More NPP- and IASI- specific recommendations

SESSION 2: Composition

Recommendation 2.2.1: **The full spectral resolution possible from CrIS be achieved for NPP and future flight units.**

Recommendation 2.2.2: **An assessment be made of the total composition products and retrieval accuracy of CrIS compared to the other IR sounders currently in orbit.**

Note: Official NPP products include only temperature and water vapor.

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More NPP- and IASI- relevant recommendations

SESSION 3: Weather

Recommendation 3.1.1: Add SSMI/S to list of instruments covered in these questions.

Recommendation 3.1.2: Product developers should provide averaging kernels and/or error co-variance matrices in addition to quality control for all retrieval products.

Recommendation 3.2.2: The sounding science community should hold annual meetings to strengthen, prioritize and revise the recommendations from this workshop.

Recommendation 3.2.3: The sounding community should encourage multi-sensor characterization and inter-comparisons for long-term sensor validation.

Recommendation 3.2.4: The spectral resolution of the CrIS short-wave and mid-wave bands should be increased to the full optical capability of 0.625 cm^{-1}.

Recommendation 3.2.5: The CrIS SDR team should adopt the calibration approach that ensures the "best" performance even if the current approach meets specification. Specifically, this applies to inter-calibration of FOVs and non-linearity corrections.

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